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Biotechnology Notes

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Biotechnology Notes, a compilation of agency activities, news events, and upcoming meetings, is prepared for members of the U.S. Department of Agriculture's (USDA) Committee on Biotechnology in Agriculture (CBA) by USDA's Office of Agricultural Biotechnology (OAB).

INSIDE USDA

INSECTS: A REAL BUGABOO FOR FARMERS

It's one thing to genetically engineer a crop to resist a pest, and quite another to make sure the same pest doesn't build up a resistance to the modified plant and start chomping away again. This is the challenge faced by researchers around the country who are studying different methods of controlling insect resistance to a protein from Bacillus thuringiensis (Bt) that is produced by recently developed, genetically engineered crops such as tomato, tobacco, cotton, and potato.

At North Carolina State University in Raleigh, entomologists Fred Gould and Tracy Johnson are trying to determine how the Bt toxin in conjunction with beneficial insects can limit pest damage. They are monitoring the survival and growth of an important pest of cotton and tobacco when the pest feeds in fields that are composed of a mixture of plants -- some producing Bt toxin; others not producing the toxin. They are also examining growth and survival of the pest when it feeds on plants that produce sublethal concentrations of the toxin.

Preliminary results from the last field season indicate that these sublethal effects may render the caterpillar stage of the pest more vulnerable to predators and parasites. Gould and Johnson believe that use of mixtures of seeds and use of plants with low levels of toxin production may slow the rate at which pests build up resistance.

The genetically engineered plants used in this research were developed by Rohme & Haas and Ciba-Geigy. Gould and Johnson's research is partially supported by USDA's Cooperative State Research Service's Competitive Research Grants Program.

TECHNOLOGY TRANSFER: USDA'S R&D CONNECTION

If necessity is the mother of invention, then USDA's Agricultural Research Service (ARS) technology transfer program is the kin

responsible for translating those inventions into practical products. Since 1986 when the Federal Technology Transfer Act went into effect, ARS scientists have signed 127 cooperative research and development agreements with commercial firms to develop products. About half of these were for products or processes developed through biotechnology. Another 34 agreements are being negotiated, and two products -- a test kit for plant viruses and an avian vaccine -- are on the market. ARS enters into a technology transfer agreement only when the research objective is commensurate with the agency's mission.

The agreements give the first right to exclusive licenses on patented inventions to the cooperating firm, which provides the expertise needed to develop and commercialize a new product, process, or service. ARS researchers also receive a percentage of the royalties.

For more information about technology transfer agreements with ARS, call 301-344-4045. Commercial firms can learn more about ARS research from several databases including TEKTRAN (301-344-4045), CRIS (301-344-3846), or AGRICOLA (301-344-3813).

NEW U.S.-E.C. TASK FORCE FORMED

New programs concerned with biotechnology seem to be sprouting up faster than ever in both the United States and the European Community (E.C.).* In an effort to improve communication among science policymakers, the United States Government and the Commission of the E.C. recently proposed a U.S.-E.C. Task Force on Biotechnology Research.

Under the draft administrative arrangement, which awaits final approval from the E.C., the task force would serve as a mechanism for exchange of information regarding the scientific aspects of biotechnology. Other activities would include reviewing research and development programs, discussing activities for collaboration, planning joint symposia, and identifying research needs.

Charles Hess, USDA Assistant Secretary for Science and Education, has been selected to serve as the first chairperson, and he has invited the E.C. to the first meeting in Washington, D.C. in early September.

For more information about the task force, contact Martha Steinbock in the Office of Agricultural Biotechnology (OAB) at 703-235-4415.

* Member nations of the E.C. include: France, Germany, the United Kingdom, Ireland, Spain, Greece, Portugal, Denmark, Luxembourg, the Netherlands, Brussels, and Italy.

STRENGTHENING THE PARTNERSHIP

USDA's Animal and Plant Health Inspection Service (APHIS) held its second national conference on Federal and State regulation of biotech products, July 10-13, in Sacramento, Calif. It was attended by almost 200 people from government, industry, academia, public interest groups, and the general public. Sessions covered updates on the status of State-Federal regulations, as well as information on regulatory developments affecting biotechnology research and development in Canada, Mexico, Germany, the E.C., and Japan.

Additional sessions sponsored by the University of California and the New Jersey Department of Environmental Protection focused on drafting a document entitled "Guidance for State Governments on Oversight of Biotechnology." In essence, the document recommends that States examine their needs and current oversight structures; encourages close communication with local, State, and Federal agencies; and stresses the need for public education.

NEWS AROUND THE COUNTRY (AND THE WORLD)

SCOPE ISSUE RESOLVED

The Office of Science and Technology Policy, Executive Office of the President, will soon publish in the Federal Register and seek comments on proposed principles on the scope of organisms that should be subject to Federal oversight before their planned introduction (release) into the environment.

Resolution of the scope issue clears the way for USDA to propose guidelines for field testing and for the Environmental Protection Agency (EPA) to propose regulations for small-scale testing of microbial pesticides and regulation of microorganisms under the Toxic Substances Control Act.

The proposed "Principles for the Scope of Oversight for the Planned Introduction Into the Environment of Organisms with Deliberately Modified Hereditary Traits" is designed to ensure safety while not unduly inhibiting these introductions.

The proposed principles include general criteria to assist agencies in developing possible categories of introductions that would be excluded from oversight. Examples include introductions involving organisms resulting from natural reproduction or the use of traditional breeding techniques; chemical or physiological processes; vascular plants regenerated from tissue culture; processes that create marker genes; self-cloning; and techniques producing new phenotypic traits conferring no greater risk to the target environment.

For more information about the proposal, call Rachel Levinson, Office of Science and Technology Policy, at 202-395-4850.

HESS ADDRESSES JOURNALISTS

Speaking at the Journalists' Conference on Food Safety and Nutrition, June 26, in Washington, D.C., Charles Hess, USDA Assistant Secretary for Science and Education, discussed what biotechnology can do to help meet today's environmental, nutritional, and food safety concerns. He pointed out that recombinant DNA technology and microinjection offer alternatives to the heavy use of pesticides, herbicides, and fertilizers. He said monoclonal antibody test kits, as well, will help farmers discover diseases early on when they can be treated without having to use large doses of drugs and chemicals. Nutritional benefits include improvements in human health that result from the use of porcine somatotropin which produces leaner pork and thus may reduce consumers' intake of fat.

He said biotechnology may be an answer to food safety problems because the technology may help to improve both the detection and control of food-borne microorganisms. He concluded his remarks noting the importance of educating consumers and addressing their concerns, conducting studies to determine the socio-economic consequences of various new technologies, and identifying ways to mitigate any possible adverse effects.

IN CASE YOU WEREN'T THERE

● "International Conference on Issues in Food Safety and Toxicology" was the theme of a meeting held May 29-June 1 at Michigan State University, East Lansing, Mich. Issues covered at the biotechnology session included transgenic plants as food, transgenic animals as food, and biotech methods for detecting food contaminants. Addressing the question whether transgenic livestock will pose food safety problems, Robert Wall of ARS's Reproduction Laboratory answered "no, at least not yet." He said that although it is not known which genetic manipulations will be effective, "it is likely that current testing protocols and regulatory mechanisms will be adequate to evaluate transgenic animals."

● "Management Strategies for Bacillus thuringiensis-Based Products" was the theme of a meeting held June 28-29 in St. Louis, Mo. and sponsored by the Monsanto Agricultural Company. Participants discussed strategies for minimizing the development of insect resistance to biopesticides in transgenic plants. Ideas offered included mixing insect-susceptible and insect resistant

seeds, lowering the expression of the Bt in the plant, and using tissue- or time-specific expression of the Bt so it produced only when needed.

- Speaking before the 5th European Congress on Biotechnology in Copenhagen, Denmark, July 9, OAB Director Alvin Young discussed USDA's system of research and oversight. The challenge for the future, he said, is to establish "a clear path of regulatory requirements which leads from field testing through the marketing of agricultural biotechnology products." He said such a journey will require U.S. interagency efforts to address issues such as food safety and patenting.

- The Department of Commerce sponsored the first of a series of seminars in Washington, D.C., July 10, entitled "Federal Technology Transfer Series: Biotechnology." The purpose of the conference was to highlight ongoing opportunities for joint research and development and licensing agreements with Federal laboratories that specialize in biotechnology. Those opportunities available at the USDA included the commercial potential in biological control of plant pests and weeds, applications to improve animal health and production, biotech for novel food and industrial products, and patents available for licensing with the Agricultural Research Service. Other Federal agencies included in the program were the National Institutes of Health, the National Institute of Standards and Technology, and the Department of Energy.

- OAB Director Alvin Young gave the dedication lecture for Utah State University's new Biotechnology building, a 43,000 square foot state-of-the-art facility that was financed through the sale of bonds. Young gave land-grant universities much of the credit for making the U.S. agricultural industry the most productive in the world. He also said that in creating a new biotech building, Utah State had the foresight to plan for the future and harness the new technology for the benefit of mankind. To meet the many challenges that lay ahead, Young said it is crucial that schools do more to recruit men and women to the agricultural sciences, and that universities pursue multidisciplinary projects that integrate agriculture with sociology, economics, and business. Anyone interested in learning more about Utah State University's new Biotechnology Center may contact the director, Steven Aust, at 801-750-2730.

NEW PUBLICATIONS

- Analytical Biotechnology: Capillary Electrophoresis and Chromatography. Edited by Csaba Horvath and John C. Nikelly. ACS Symposium Series No. 434. Published by the American Chemical Society. July 1990. \$49.95. To order call 202-872-4600.

- Biosafety in the Laboratory: Prudent Practices for Handling and Disposal of Infectious Materials. Prepared by the Committee on Hazardous Biological Substances in the Laboratory, National Research Council. 1989. \$29.95. To order call 1-800-624-6242.
- Shaping the Future: Biology and Human Values, by Steve Olson for the Board on Biology, National Research Council. 1989. \$14.95. To order call 1-800-624-6242.
- Managing Forest Genetic Resources. Prepared by the Committee on Managing Global Genetic Resources, National Research Council. April 1990. About \$19.95. To order call 1-800-624-6242.
- Alternative Agriculture. Prepared by the Committee on the Role of Alternative Farming Methods in Modern Production Agriculture, National Research Council. 1989. \$29.95. To order call 1-800-624-6242.

UPCOMING MEETINGS

Aug. 12-18: Symposium on Genetics of Industrial Microorganisms. Strasbourg, France. Write to Societe Francais de Microbiologie, 28, rue du Docteur Roux-75724, Paris, Cedex 15, France.

Aug. 15-17: Ag Biotech International: Business Opportunities for the '90's. Spokane, Wash. For details write to Ag Bureau, P.O. Box 2147, Spokane, Wash. 99210.

Aug. 21-24: Conference on Biotechnology and Environmental Science: Molecular Approaches. Bangkok, Thailand. Call Ray Rodriguez at the University of California, Davis, at 916-752-3263.

Aug. 22-23: Life Sciences Technology Transfer Conference. Chicago, Ill. Write to Al Frye, Technology Transfer Conferences, 325 Plus Park Blvd., #108, Nashville, Tenn. 37217.

Aug. 23-30: Fifth International Congress of Ecology: Development of Ecological Perspectives for the 21st Century. Yokohama, Kanagawa, Japan. Sponsored by the Science Council of Japan and the Ecological Society of Japan. Call 615-574-0390.

Aug. 25-31: 22nd International Conference on Animal Genetics. East Lansing, Mich. Write to R. W. Bull, c/o College of Veterinary Medicine, A-132 East Fee Hall, Michigan State University, East Lansing, Mich. 48824.

Aug. 26-31: 200th American Chemical Society National Meeting.

Washington, D.C. Call 202-872-4396.

Sept. 12-13: Workshop on Biopesticide Registration Issues. Washington, D.C. Sponsored by the IBA and the Environmental Protection Agency. Call 202-857-0244 for details.

Sept. 17-20: AgTech '90. St. Louis, Mo. Sponsored by AgBiotechnology News. Call 319-277-3599.

Sept. 18-20: Biotechnica '90. Hannover, West Germany. Call 609-987-1202; FAX 609-987-0092.

Sept. 24-26: Third International Symposium on Biotechnology and Nutrition. University of Maryland, College Park, Md. OAB Director Alvin Young will be speaking on international perspectives of nutrition and biotechnology. For more information call 301-454-6056 or 301-344-3338.

Oct. 22-24: Anabiotech '90: Third International Symposium on Analytical Methods in Biotechnology. San Francisco, Calif. Sponsored by the American Chemical Society and the International Biotechnology Suppliers Association. Call 312-527-2011.

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Biotechnology Notes is prepared by Marti Asner, public affairs specialist in USDA's Office of Agricultural Biotechnology. Suggestions for items to include in future issues are always appreciated and may be sent to USDA/OAB, Room 321-A, Administration Bldg., 14th and Independence Ave., S.W., Washington, D.C. 20250; or call 703-235-4416. The FAX number is 703-235-4429.

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